VERMONT

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September 8, 2014

Laurie Adams, Assistant Director – Water Quality
Department of Public Works
City of Burlington
P.O. Box 878
Burlington, Vermont 05402-0878

Subject: Burlington Riverside Wastewater Treatment Facility
Compliance Evaluation Inspection
NPDES #VT0100307, Discharge Permit #3-1247

Dear Ms. Adams:

On August 8, 2014, I conducted a Compliance Evaluation Inspection (CEI) of the Burlington Riverside Wastewater Treatment Facility (WWTF) located at 267½ Riverside Avenue. CEIs are intended to verify compliance with discharge permits, self-monitoring requirements, and compliance schedules. CEIs are a relatively in-depth inspection of the WWTF, self-monitoring records and reports, and other required records. You and Chief Operator Gary Greenwood accompanied me during the inspection.

CEIs do not include sampling of the effluent for analysis. Although the final effluent was not analyzed, a sample of the effluent observed during the CEI appeared clear with no color, turbidity, or solids and of excellent quality.

The overall rating for the Burlington Riverside WWTF CEI is "Acceptable" which is the second highest rating in our five tier rating system.

Self-Monitoring Data Review

A review of the self-monitoring reports (i.e. WR-43 forms) received for the Burlington Riverside WWTF during the twelve months prior to the inspection (July 1, 2013 to June 30, 2014) revealed there were four permit violations:

Date	Effluent Characteristic	Result	Permit Limit	Basis
7/23/2013	*E. coli*	148 colonies/100 ml	77 colonies/100 ml	Instantaneous Maximum
11/15/2013	BOD_5	63 mg/l	45 mg/l	Weekly Average
11/15/2013	BOD_5	63 mg/l	50 mg/l	Maximum Day
11/15/2013	TSS	50 mg/l	45 mg/l	Weekly Average

It is not known what caused the 7/23/2013 *Escherichia coli* bacteria (*E. coli*) violation. At the time the effluent sample was taken, the Total Residual Chlorine (TRC) concentration (prior to dechlorination) was 0.92 mg/l and the effluent was described as turbid but with no suspended solids. The TRC concentration should have been sufficient for proper disinfection. The cause of the turbidity is unknown but could be the result of heavy rains that fell prior to the violation.

The 11/15/2013 5-day Biological Oxygen Demand (BOD_5) and Total Suspended Solids (TSS) violations were the result of a process upset caused by a primary clarifier sludge pump that was inadvertently left on for an extended period. This incident was referred to the DEC Compliance and Enforcement Division and after an investigation Environmental Citation/Civil Complaint #13EC01043 was issued to the City.

The 5-day Biological Oxygen Demand (BOD_5) and Total Suspended Solids (TSS) removal over the 12 month period averaged 96.1%and 95.9% respectively. These are very good removal rates and indicate the WWTF's activated sludge process is well operated.

Discharge Permit #3-1247 limits the amount of Total Phosphorus discharged to 2,191 pounds per year. During 2013, the Burlington Riverside WWTF discharged a total of 646 pounds of Total Phosphorus, or about 29% of the permitted limit.

The WR-43 forms submitted for the Burlington Riverside WWTF are very clear, well prepared, and include additional information that helps one ascertain how the WWTF is performing. The addition information includes:

- Monthly Compliance Reports summarizing each discharge parameter that needs to be reported including a simple "Pass/Fail" assessment;
- Summary Reports of the discharge parameters for the past 12 months; and
- Monthly Chemical Usage Reports that include chemical cost information.

Other Effluent Monitoring Requirements

Conditions I.A.1 and I.F.2 of Discharge Permit #3-1247 requires weekly monitoring for Total Kjeldahl Nitrogen (TKN) and quarterly monitoring for Total Copper and Total Zinc. Monitoring for TKN is not required from November 1 to May 31. The Permit does not establish effluent limits for these parameters. The results have been submitted as required with the appropriate WR-43 submittal.

Condition I.F.3 requires annual monitoring for: Temperature, Ammonia, Dissolved Oxygen, Nitrate/Nitrite, Oil & Grease, and Total Dissolved Solids. The Permit does not establish effluent limits for these parameters. The 2013 samples were taken on February 19, 2013 and were submitted as part of the March 2013 WR-43 submittal. The 2014 samples were taken on June 10, 2014 and were submitted as part of the July 2014 WR-43 Submittal. Gary knows to take future samples so that the samples reflect seasonal variations.

Facility Tour and Inspection

All equipment and facilities at the Burlington Riverside WWTF were inspected, including the:

- Headworks including the bar rack and aerated grit removal
- Primary Clarifiers (2 units)
- Aeration Tanks (3 sets)
- Secondary Clarifiers (3 units)
- Chlorine Contact Tanks (2 units)
- Effluent flow measurement (2 units)
- Sodium Aluminate addition for Phosphorus removal
- Septage receiving
- Anaerobic sludge digesters
- Influent and effluent sampling locations
- Emergency generator

At the time of the CEI all equipment and facilities were fully operational and in use. All equipment and facilities were in good to excellent condition. Overall, the WWTF including buildings and grounds appear to be well maintained.

The timing system used to control the primary sludge pumps was replaced after the process upset that occurred on November 15, 2013. The new timing system includes manually-set timers that are used when scum is being pumped from the scum wells (by the primary sludge pumps) to the anaerobic digesters. The timers can be set to a maximum of 60 minutes meaning this is the longest time the sludge pumps will operate when pumping scum. This essentially eliminates the possibility of repeating the November 15 process upset.

The effluent flow is measured via two 90° V-Notch weirs located at the end of each Chlorine Contact Tank. The water elevation behind the weirs is measured by an ultrasonic meter. The effluent flow meter calibration is checked by placing a horizontal steel plate (target baffle) below the ultrasonic meter so that it is positioned 8 inches above the bottom of the V-Notch weir. The plate is supported by steel brackets that are permanently mounted to the concrete tank walls. This is an acceptable method of checking the accuracy of the effluent flow meter. As required by Condition II.A.4., the flow meter calibration is checked weekly.

Influent samples are taken from the channel between the bar screen and aerated grit chamber. This location is downstream of where septage is added. Influent composite samples are collected with a refrigerated composite sampler. Effluent samples are collected from the effluent manhole downstream of both Chlorine Contact Tanks. Effluent composite samples are also collected with a refrigerated composite sampler. A bimetallic strip-type refrigerator/freezer thermometer was in the refrigerated compartment of both composite samplers and both indicated the temperature was less than 6°C.

Federal regulations require that the composite samples be cooled to at least 6^{o}C as they are being collected. During collection of composite samples, the temperature needs to be recorded at the beginning and end of the sampling period. The thermometers currently being used are fine, however they need to be calibrated against a NIST traceable thermometer at least once per year.

Laboratory Tour and Inspection

I conducted a quick tour and inspection of the laboratory. The laboratory was very neat and clean appears to be adequate for the tests and analyses performed.

In terms of the analysis required to be reported monthly on the self-monitoring reports (i.e. WR-43s), Settleable Solids, pH, and Total Residual Chlorine are performed on-site, Total Kjeldahl Nitrogen, Total Phosphorus, and *E. coli* Bacteria are done at the Burlington Main WWTF's laboratory, and $BOD_{5,}$ Total Suspended Solids, Total Copper, and Total Zinc are done by an outside laboratory.

In terms of the analyses required to be reported annually, Dissolved Oxygen and Temperature are performed on-site, Ammonia and Nitrate/Nitrite are done at the Burlington Main WWTF, and Oil & Grease, and Total Dissolved Solids are done by an outside laboratory.

The pH meter is calibrated daily with pH 4.00 and pH 7.00 buffers and then checked with a pH 7.00 buffer from a different lot which also has a different color. The pH probe appeared to be in excellent condition and was stored in a small beaker of pH 4.00 buffer. The three liquid buffers (pH 4.00, pH 7.00, and pH 7.00 from a different lot) were within their expiration dates.

The Hach DR\700 Colorimeter used for Total Residual Chlorine analysis had a Q.C Services, Inc. (Harrison, Maine) service sticker stating the unit was serviced on 6/10/2014. It was not possible to tell if the DPD-Chlorine-LR

Secondary Standards were within their expiration date since the portion of the label where the expiration date is printed was worn.

The Fisher Scientific A-250 scale had a sticker stating the scale was calibrated by All State Scale Co. (Somers, Connecticut) on 11/12/2013.

I was shown a copy of the "Riverside Avenue Wastewater Facility Laboratory Quality Control Manual".

WWTF Records and Documents Review

Gary produced copies of:

- The current Burlington Riverside WWTF Direct Discharge Permit #3-1247 (effective October 1, 2004).

- The electric power failure plan (EPFP) approved by DEC on February 23, 2005. The EPFP is required by Condition I.G. of Discharge Permit# 3-1247 and needs to address the WWTF and any pump stations.

- The Operations, Maintenance, and Emergency Response Plan (OM&ER Plan) for the WWTF, sewage pump stations, and stream crossings approved by DEC on August 20, 2009 and the OM&ER Plan for the collection system approved by DEC on April 27, 20110. OM&ER plans are required by State Statue (10 VSA§1278).

A cursory review of the WWTF's records for the past three years was conducted, including the self-monitoring reports (i.e. WR-43s), daily bench sheets, contract laboratory reports, and flow charts. The records appear to be complete and well organized. I compared the data provided on a self-monitoring report against the daily bench sheets and contract laboratory reports for November 2013 and found one discrepancy – the WR-43 reports the effluent Settleable Solids on November 18 as "0.00" while the bench sheet for that date did not include a Settleable Solids result.

Maintenance and Safety Programs

My overall impression is the City has very good maintenance and preventative maintenance as well as safety programs. Gary stated they use commercially available software for their maintenance program and showed me a work order it generated for cleaning a blower intake filter. I observed the confined space notebook that contains checklists for the confined spaces at the Riverside WWTF. There is a well-organized Lockout/Tagout box located in the control building.

The City uses Mountain Air Systems Inc. for inspection and maintenance of backflow prevention devices. According to the Mountain Air Systems Report Form Gary showed me, the backflow prevention devices were last inspected/maintained on 2/7/2014. The Wastewater Management Program recommends backflow preventers be professionally inspected at least once every two years.

Chemical Storage

The chemicals used at the Burlington Riverside WWTF include Sodium Aluminate (for Phosphorus removal), Sodium Hypochlorite (for disinfection), and polymer (to help with clarification). All chemicals appear to be properly stored with adequate containment.

Collection System

The Burlington Riverside WWTF collection system was not inspected as part of this CEI. The collection system includes both sanitary sewers (i.e. carries sewage only) and combined sewers (i.e. carries both sewage and

stormwater). According to the OM&ER Plan, the collection system has about 1.8 miles of sanitary sewers and 0.5 miles of combined sewers. The collection system has four pump stations and no river crossings.

There is one combined sewer overflow (CSO) – the "Colchester Avenue CSO" which is located near the intersection of Colchester Avenue and Riverside Drive and discharges to the Winooski River. The Colchester Avenue CSO is not identified in or addressed by Discharge Permit #3-1247 since it was discovered by the City after the Permit was issued.

The City installed a monitoring system so the start and end of overflow events at the Colchester Avenue CSO are accurately recorded. A listing of overflow events at this CSO is included with each monthly WR-43 for the Burlington Riverside WWTF. The City modeled the hydraulic conditions at the CSO and calculated the amount of sewage that is discharged during overflow events at the Colchester Avenue CSO. The City estimates that at the point the CSO starts to overflow, the sewage portion of the overflow is 15% or 50 gpm.

Summary and Recommendations

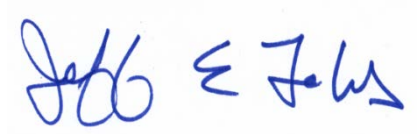
The overall inspection rating for the Burlington Riverside WWTF for the period July 1, 2013 to June 30, 2014 is "Acceptable", the second highest rating in our five tier rating system. There were four permit violations during the inspection period. Three of the violations were due to a single incident and the City has installed equipment (manual timers) which should essentially eliminate the potential for the incident to be repeated. It is evident that the WWTF is well operated and maintained and that Gary and the other operators are doing a good job. The support of the City is also appreciated.

The following actions or steps **must** be completed or implemented:

- The thermometers in the refrigerated portion of the influent and effluent composite samplers need to be calibrated against a NIST Traceable thermometer at least once per year. The temperature inside the refrigerator at the start and end of collecting composite samples should be recorded.

If you have any questions or comments, please feel free to contact me at (802) 490-6185 or jeff.fehrs@state.vt.us.

Sincerely,



Jeffrey E. Fehrs, P.E.
Environmental Engineer
Operations and Management Section

Enclosure: EPA Water Compliance Inspection Report

Cc: Gary Greenwood, Chief Operator, Burlington Riverside Wastewater Treatment Facility (electronic copy)
Andrew Spejewski, Environmental Engineer, U.S. EPA Region 1 (electronic copy)
Ernie Kelley, Program Manager, Wastewater Management Programs, VT DEC (electronic copy)
Burlington River Wastewater Treatment Facility Compliance File

United States Environmental Protection Agency
Washington, D.C. 20460

Water Compliance Inspection Report

Section A: National Data System Coding (i.e., PCS)

Transaction Code	NDPES	yy/mm/dd	Inspection Type	Inspector	Fac Type
1 N	2	3 VT0100307	11 12 14/08/08	17 18 C	19 S	20 1

Inspection Type Description

Remarks

21 66

Inspection Work Days	Facility Self-Monitoring Evaluation Rating	B1	QA	Reserved
67 . 69	70 4	71 N	72 N	73 74 75 80

Section B: Facility Data

Name and Location of Facility Inspected (For industrial users discharging to POTW, also include POTW name and NPDES permit number)	Entry Time/Date	Permit Effective Date
	8:55 am 8/8/2014	October 1, 2004
	Exit Time/Date	**Permit Expiration Date**
Burlington Riverside WWTF 267 1/2 Riverside Avenue Burlington, Vermont	1:20 pm 8/8/2014	September 30, 2009 (a)

Name(s) of On-Site Representative(s)/Title(s)/Phone and Fax Number(s)	Other Facility Data
Gary Greenwood, Chief Operator, Phone: (802) 863-4878	

Name, Address of responsible Official/Title/Phone and Fax Number.
Laurie Adams, Assistant Director DPW Water Quality Phone: (802) 863-4501
City of Burlington
P.O. Box 878, Burlington, VT 05402

Contacted: [X] Yes [ ] No

[X] Permit	[X] Self-Monitoring Program	[ ] Pretreatment	[ ] MS4
[X] Records/Reports	[ ] Compliance Schedules	[ ] Pollution Prevention	
[X] Facility Site Review	[ ] Laboratory	[ ] Storm Water	
[X] Effluent/Receiving Waters	[X] Operations & Maintenance	[ ] Combined Sewer Overflow	
[ ] Flow Measurement	[ ] Sludge Handling/Disposal	[ ] Sanitary Sewer Overflow	

Section D: Summary of Findings/Comments (Attach additional sheets of narrative and checklists as necessary)

SEV Codes	SEV Description

Please refer to the attached letter dated September 8, 2014

(a) A complete permit renewal application was received prior to the application deadline. The current Discharge Permit remains in effect until the renewed Discharge Permit is issued.

Name(s) and Signature(s) of Inspector(s)	Agency/Office/Phone and Fax Numbers	Date
Jeffrey E. Fehrs, P.E.	VT ANR/DEC/Watershed Mgmt. Div./O&M Sect. Phone: (802) 490-6185 Fax: (802) 828-1544	9/8/2014
Signature of Management QA Reviewer	Agency/Office/Phone and Fax Numbers	Date